National Institute of Environmental Health Sciences

Cholera in Bangladesh: Climatic components of seasonal variation

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Year: 2010
Journal: Epidemiology. 21 (5): 706-710

Abstract:

BACKGROUND: The mechanisms underlying the seasonality of cholera are still not fully understood, despite long-standing recognition of clear bimodal seasonality in Bangladesh. We aimed to quantify the contribution of climatic factors to seasonal variations in cholera incidence. METHODS: We investigated the association of seasonal and weather factors with the weekly number of cholera patients in Dhaka, Bangladesh, using Poisson regression models. The contribution of each weather factor (temperature and high and low rainfall) to seasonal variation was estimated as the mean over the study period (1983-2008) for each week of the year of each weather term. Fractions of the number of cholera patients attributed to each weather factor, assuming all values were constant at their minimum risk levels throughout the year, were estimated for spring and monsoon seasons separately. RESULTS: Lower temperature predicted a lower incidence of cholera in the first 15 weeks of the year. Low rainfall predicted a peak in spring, and high rainfall predicted a peak at the end of the monsoon. The risk predicted from all the weather factors combined showed a broadly bi-modal pattern, as observed in the raw data. Low rainfall explained 18% of the spring peak, and high rainfall explained 25% of the peak at the end of the monsoon. CONCLUSIONS: Seasonal variation in temperature and rainfall contribute to cholera incidence in complex ways, presumably in interaction with unmeasured environmental or behavioral factors.

Source: http://dx.doi.org/10.1097/EDE.0b013e3181e5b053

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Country

Other Asian Country: Bangladesh

Health Impact: M

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Cholera

Resource Type: M

format or standard characteristic of resource

Research Article

Timescale: M

time period studied

Time Scale Unspecified